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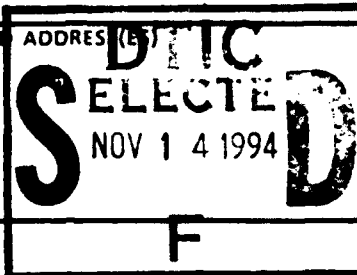


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13. ABSTRACT (Maximum 200 words) SHELL 1991 QUARTERLY WATER-LEVELS WILL BE MEASURED IN AND BEYOND THE SOUTH TANK PLUME AREA. THE OBJECTIVE OF THE WATER-LEVEL MEASUREMENT PROGRAM IS TO COLLECT SUFFICIENT INFORMATION TO MONITOR ANY TEMPORAL HYDROGEOLOGIC CHANGES OCCURRING AND WHAT EFFECT THEY MAY HAVE ON THE STEP. THIS REPORT PROVIDES THE RESULTS OF THE MOST RECENT MONITORING EVENT, COMPLETED SEPT 13, 1991.			
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SOUTH TANK FARM PLUME

11

Denver, Colorado

Denver, Colorado

October 1991

Commerce City, Colorado

INTRODUCTION

As described in the Final Implementation Document for the South Tank Farm Plume (STFP) Interim Response Action (IRA) (Shell 1991), quarterly water-levels will be measured in and beyond the STFP area. The objective of the water-level measurement program is to collect sufficient information to monitor what, if any, temporal hydrogeologic changes may be occurring and what effect they may have on the STFP. This report provides the results of the most recent monitoring event, completed September 13, 1991.

RESULTS

The results of the September 1991 water-level measurements are illustrated by the water table contour map shown by Figure 1. The general groundwater hydrology has changed since June 1991 (Figure 2), as shown on Figure 3 which gives the change in water-level for each well. However, the groundwater flowpaths have not changed, nor has the effect of Lake Ladora on the local groundwater.

Water-levels in the tank farm have risen over 2 feet since the last quarter. This increase in water table elevation is most likely due to a combination of the heavy precipitation which has occurred during the summer and a water line break which occurred near Building 316A in August and was not repaired until mid-September.

Water-levels in Lower Derby Lake and the wells adjacent to the lake have declined since last quarter. This is due to the lowering of the lake in order that repairs to sections of rip-rap may be made. The Army started lowering the lake in early September.

The most recent water-levels in Lake Ladora and the wells nearest the lake exhibit similar patterns to those observed during June and July 1991 (Figures 4 through 10). Water-levels in this area have increased slightly (less than 0.5 feet) since last quarter due to the heavy precipitation received during this summer. At the beginning of August, Sand Creek Lateral was full of flowing water along the entire length of Lake Ladora. In addition, Figure 11 shows that the Army has been maintaining the level of Lake Ladora at an elevation of approximately 5220 feet or above.

CONCLUSIONS

While water-levels vary from last quarter's measurements, the hydrogeologic conditions have not significantly changed within and around the STFP area. There are no hydrologic effects which indicate the STFP will impact Lake Ladora. Therefore, regular monitoring, as outlined in the Final Implementation Document, remains the appropriate course of action for this IRA.

REFERENCES

Shell Oil Company, August 1991, Final Implementation Document,
Other Contamination Sources Interim Response Action, South
Tank Farm Plume

Legend

- Existing Well Location
- ◇ Existing Cluster Well Location
- Water Level Location
- Drainage
- Railroad
- Section Boundary
- ▨ Lakes
- Building/Structure
- Berm
- 5245.5 Water Level Elevation (Feet above MSL)
- Contour Interval Dashed where Inferred

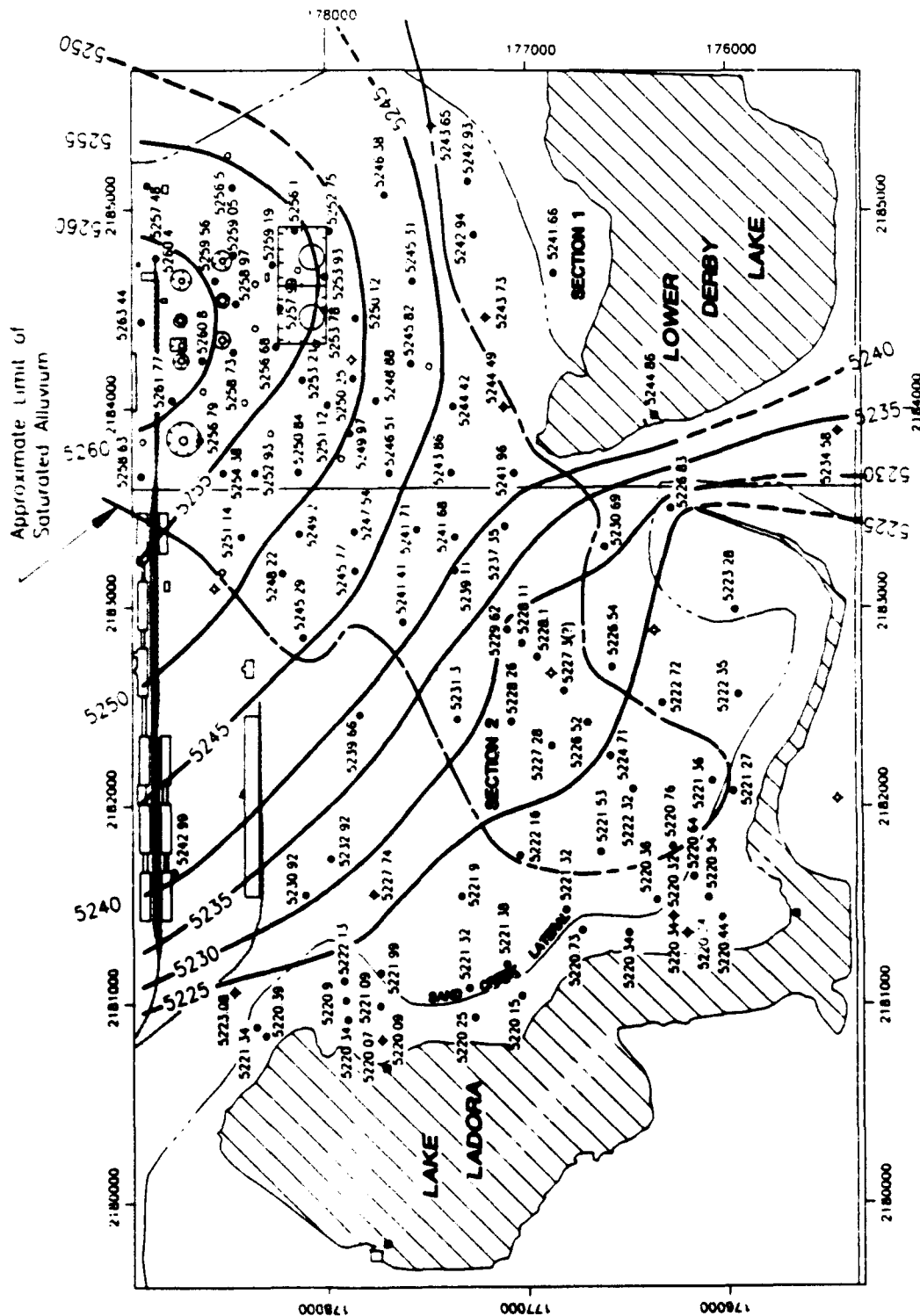


0 250 500 1000
FEET

ROCKY MOUNTAIN ARSENAL
South Tank Farm Area

Figure 1

Water Table
Contour Map
September 13, 1991



Legend

- Existing Well Location
- ◇ Existing Cluster Well Location
- Water Level Location
- - - Drainage
- Railroad
- - - Section Boundary
- ▨ Lakes
- Building/Structure
- Berm
- 5245.5 Water Level Elevation (Feet above MSL)

Contour Interval
Dashed where Inferred



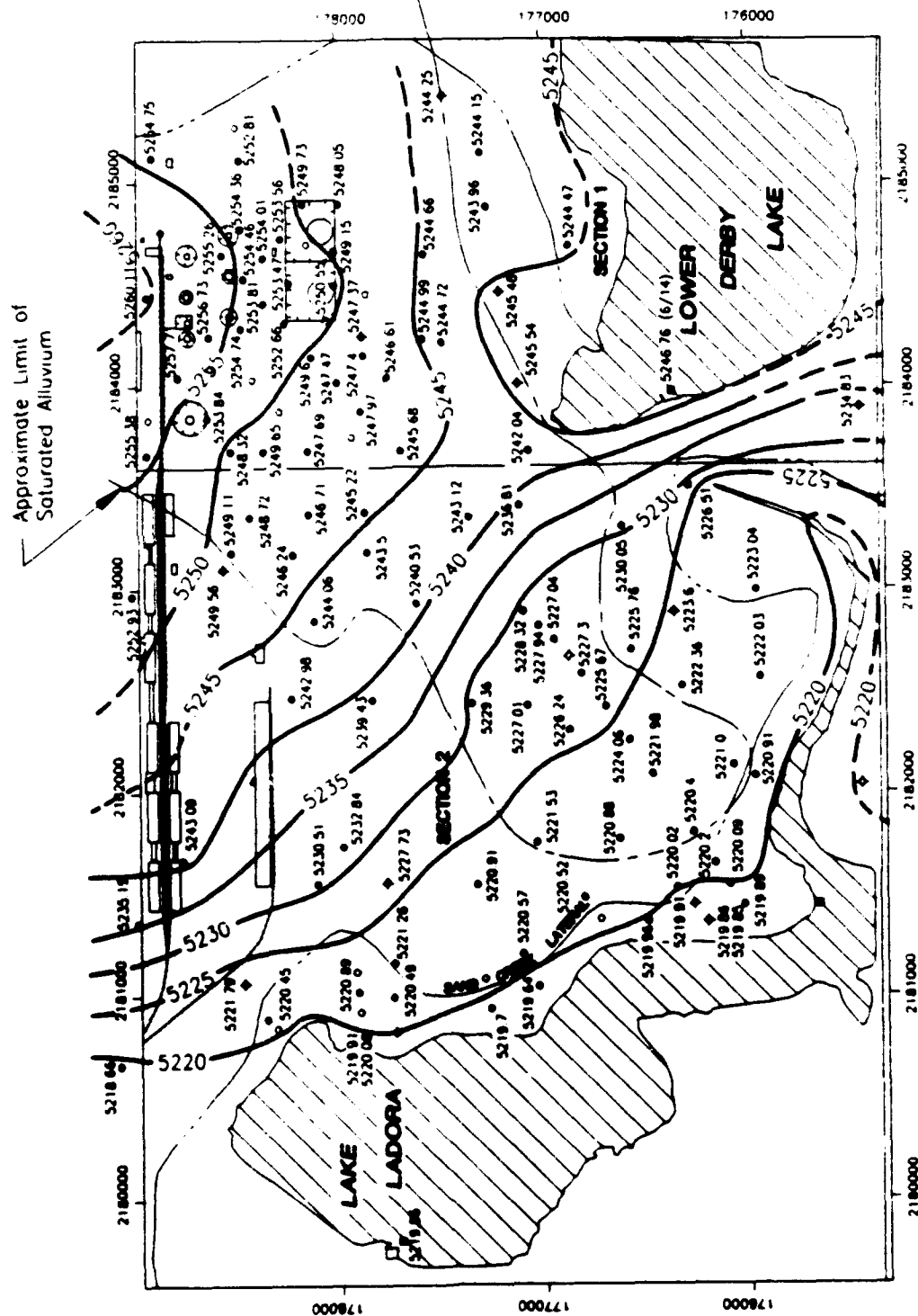
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ROCKY MOUNTAIN ARSENAL
South Tank Farm Area

Figure 2

Water Table
Contour Map
June 1991

ROCKY MOUNTAIN ARSENAL CORPORATION
OF DENVER, COLORADO



Legend

- Existing Well Location
- ⊕ Existing Cluster Well Location
- Water Level Location
- - - Drainage
- Railroad
- - - Section Boundary
- ▨ Lakes
- Building/Structure
- Berm
- 0.50 Change in Water Table Elevation in Feet (Negative for Decrease)
- Above this line Water Table Elevation Increased more than 2 Feet.
- Below this line, Water Table Elevations Decreased



**ROCKY MOUNTAIN ARSENAL
South Tank Farm Area**

Figure 3

Change in Water Table
Elevations Between June 1991
and September 1991

LOCKPORT INDUSTRIES CORPORATION
OF THE UNITED STATES OF AMERICA

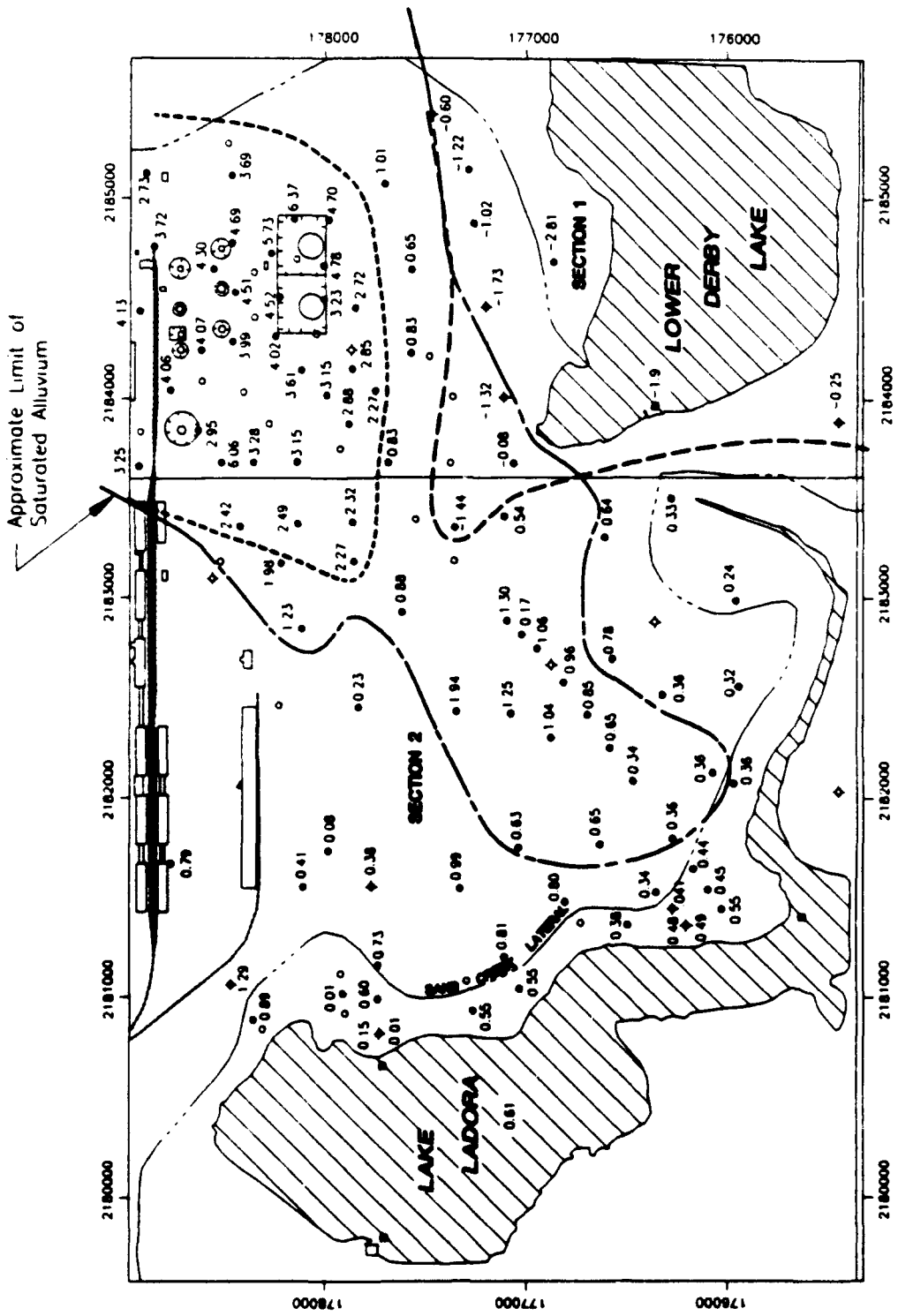


FIGURE 4
WATER LEVELS NEAR LAKE LADORA

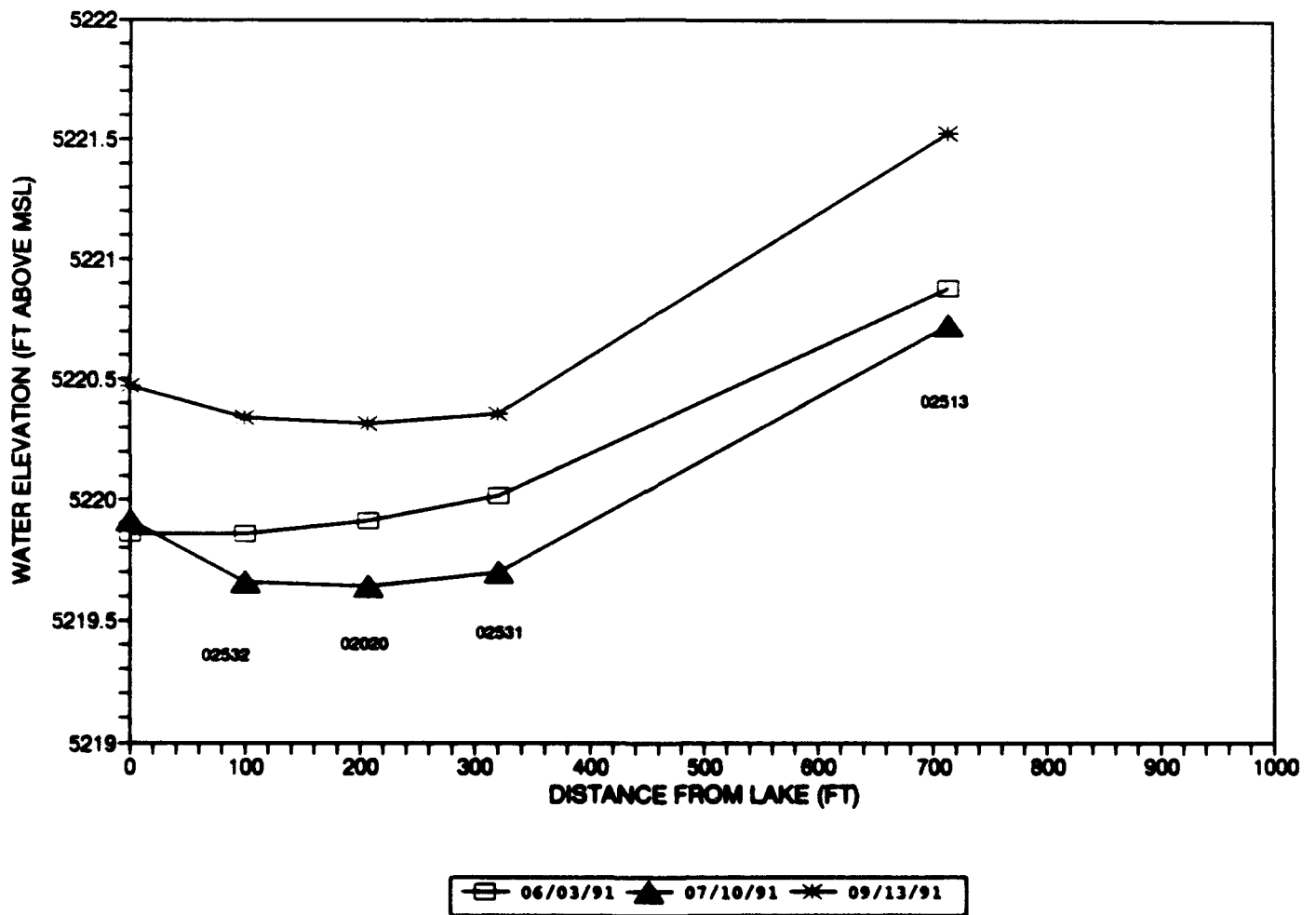


FIGURE 5
WATER LEVELS NEAR LAKE LADORA

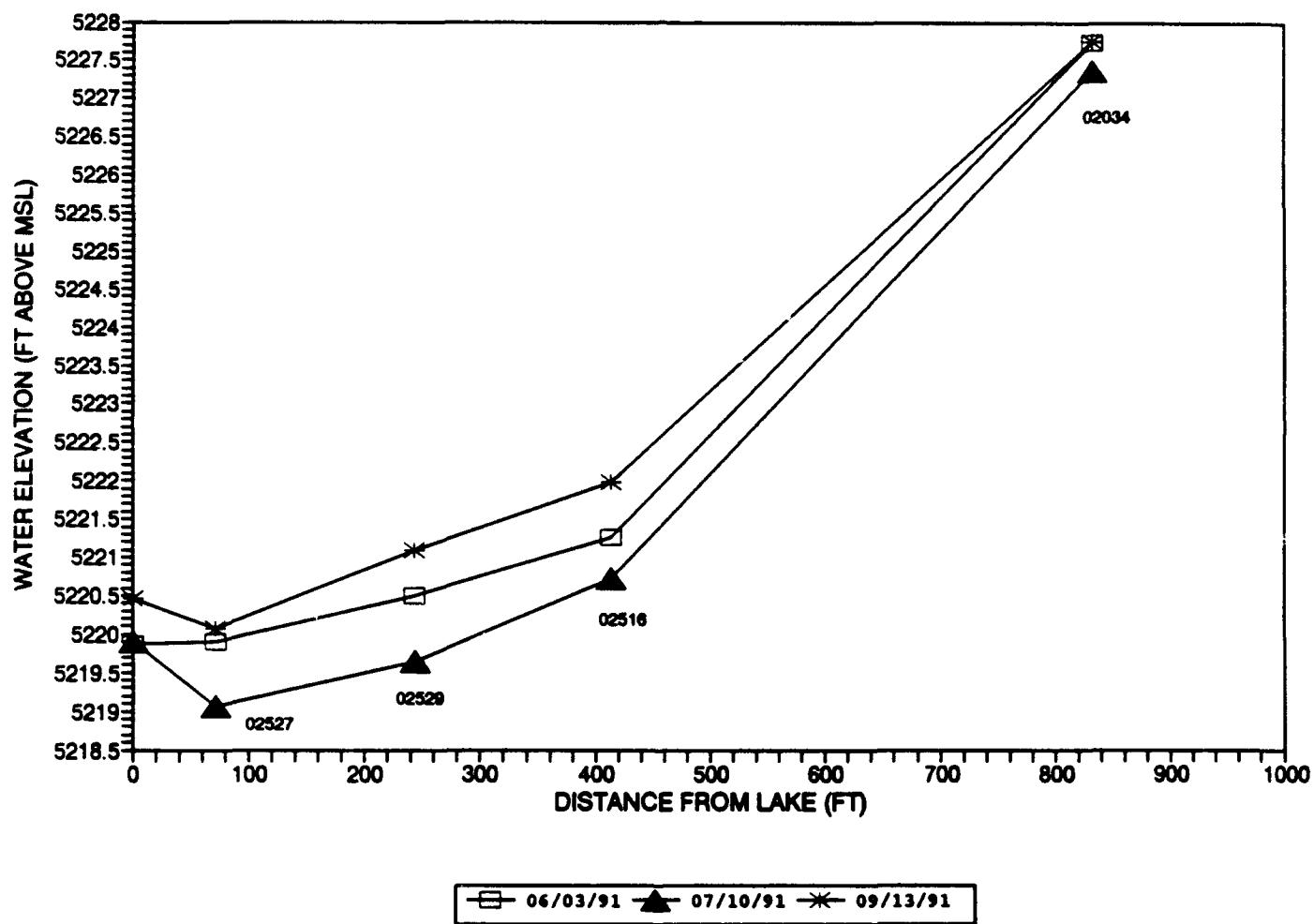


FIGURE 6
WATER LEVELS NEAR LAKE LADORA

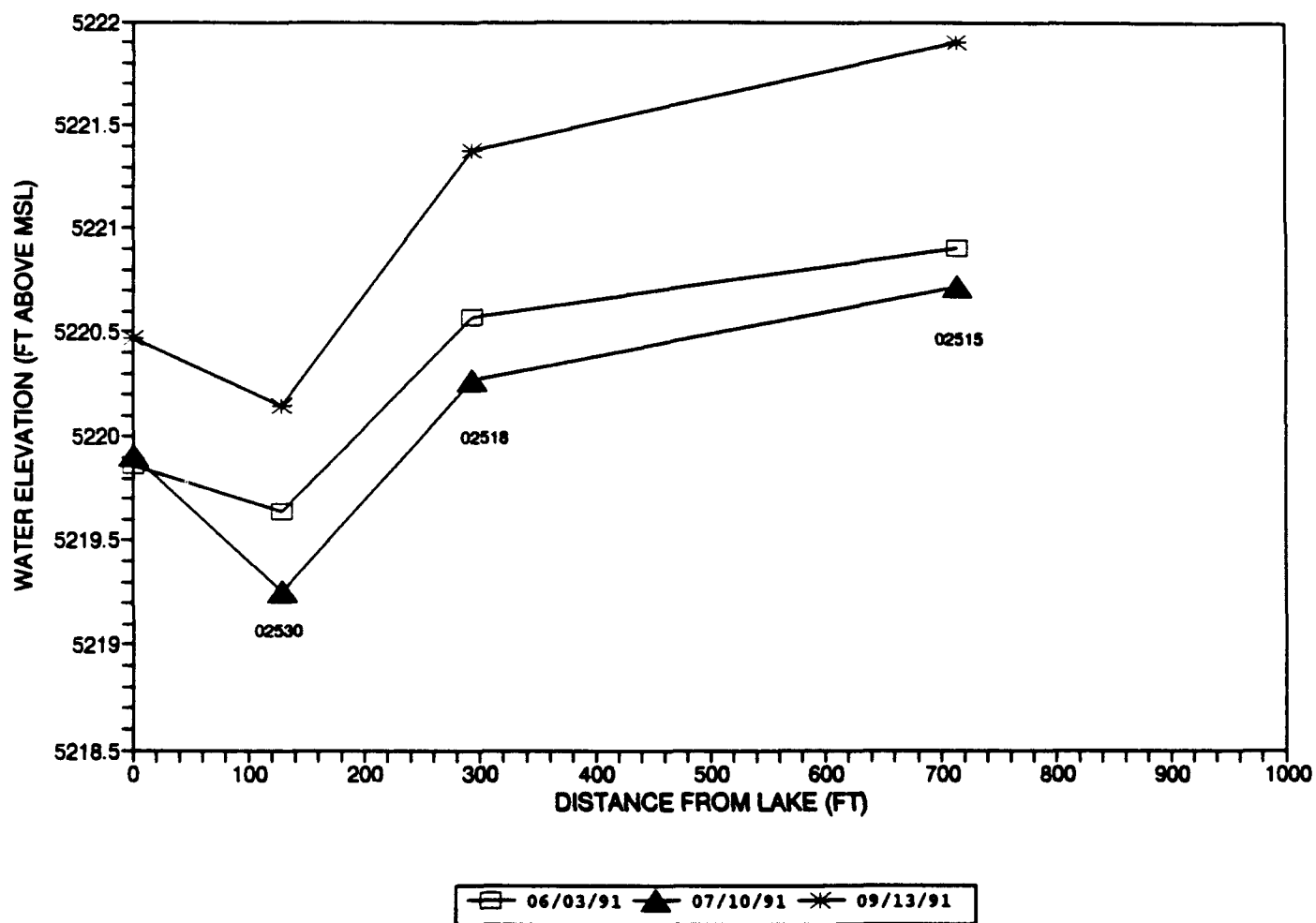


FIGURE 7
WATER LEVELS NEAR LAKE LADORA

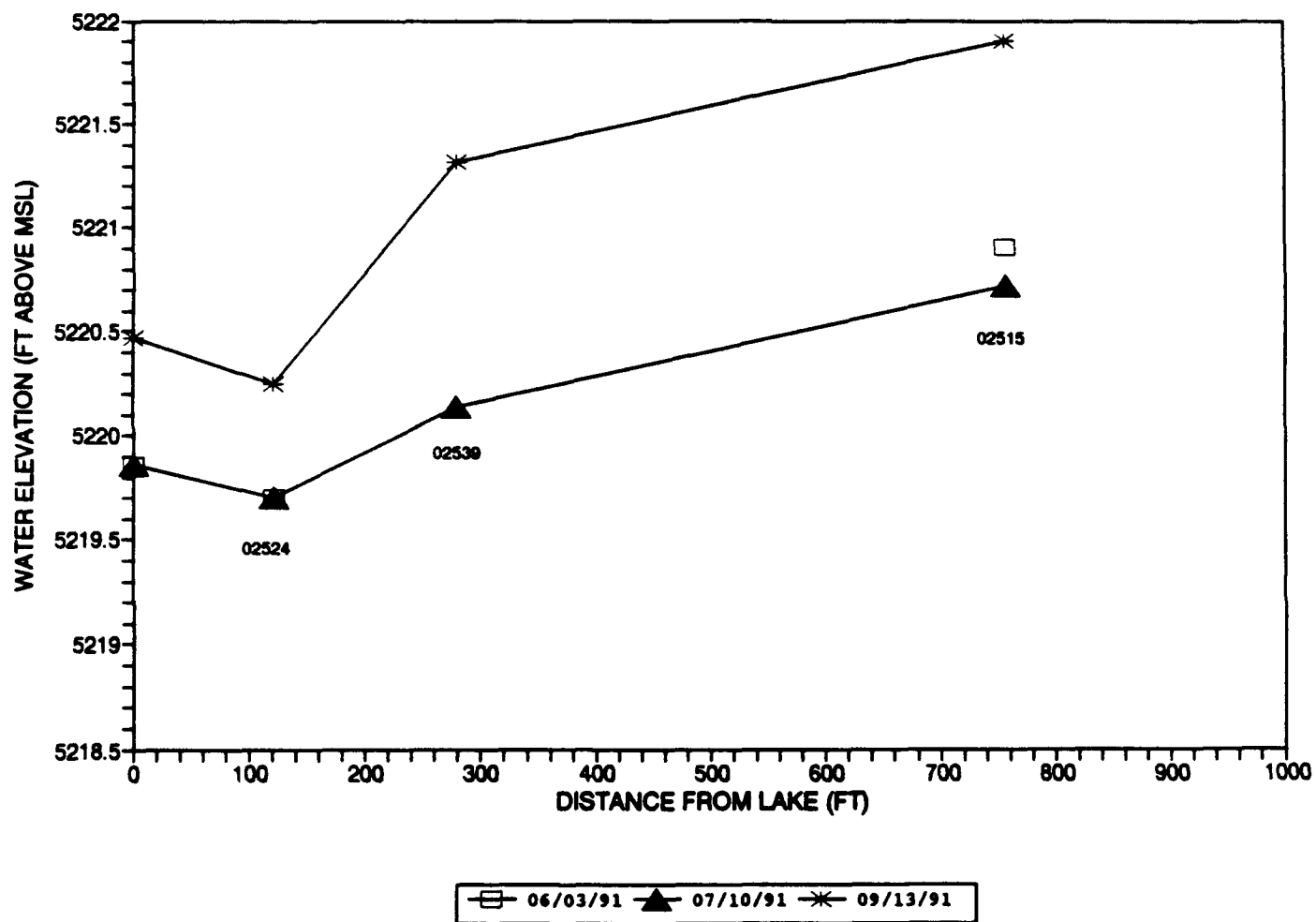


FIGURE 8
WATER LEVELS NEAR LAKE LADORA

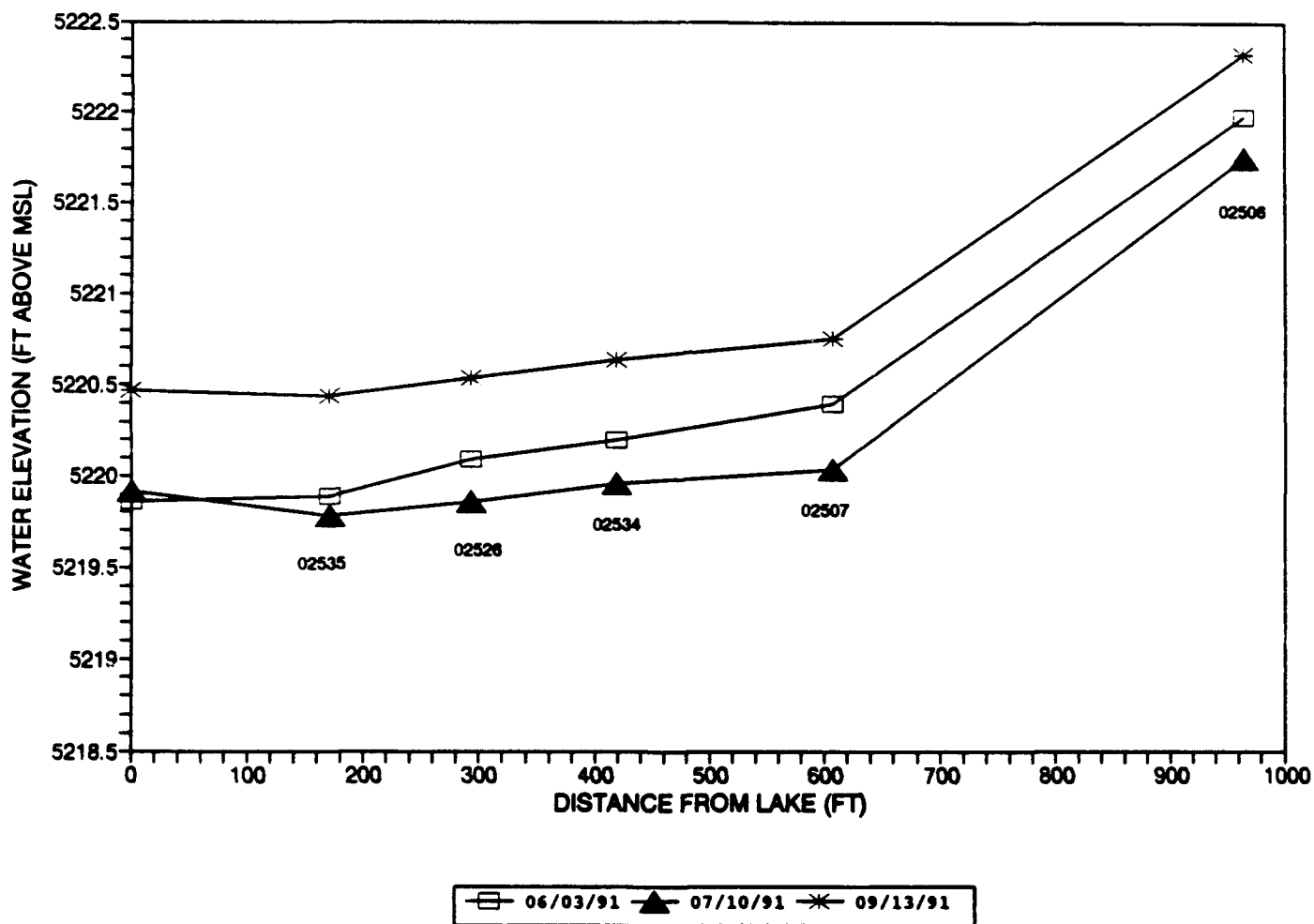
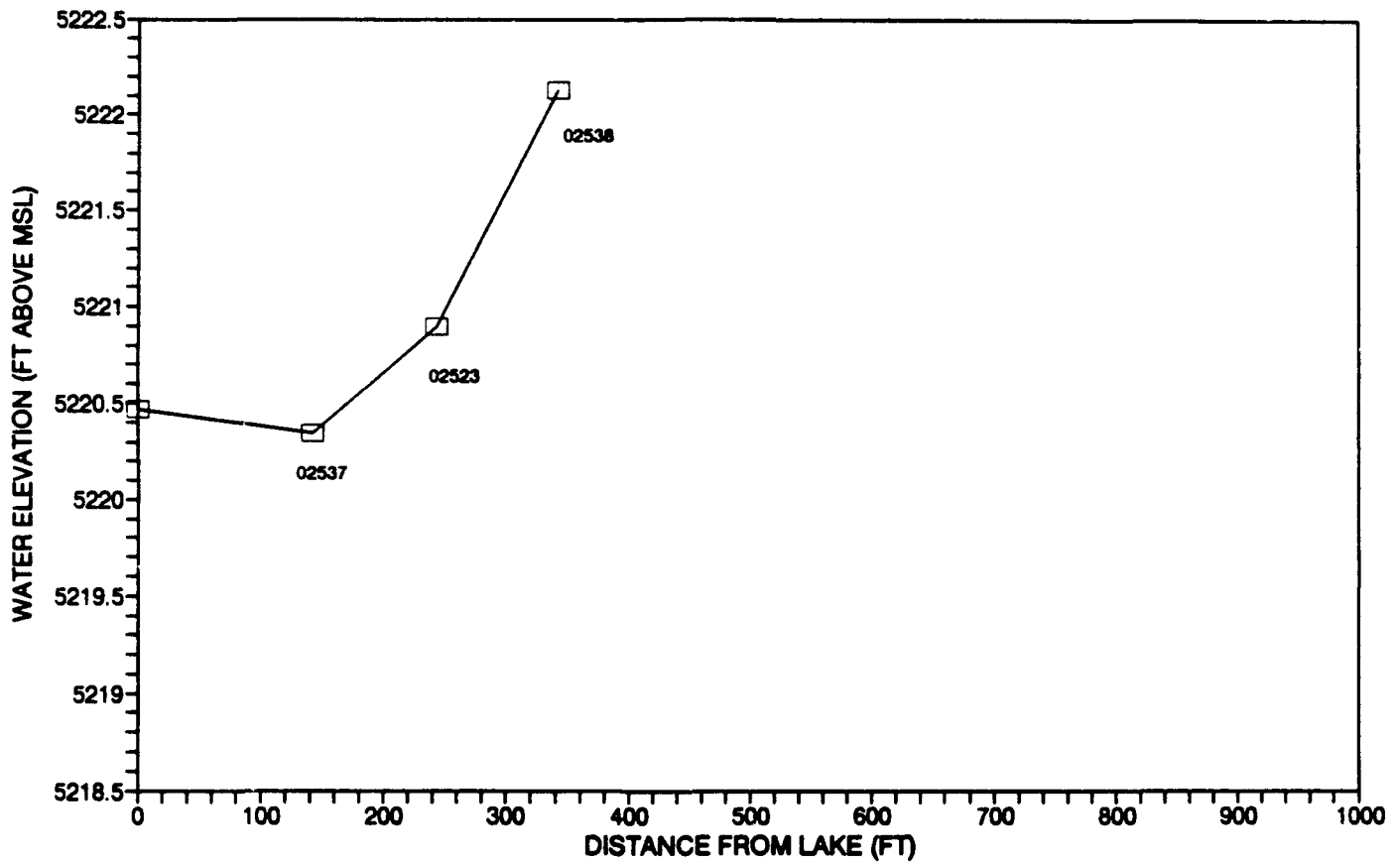
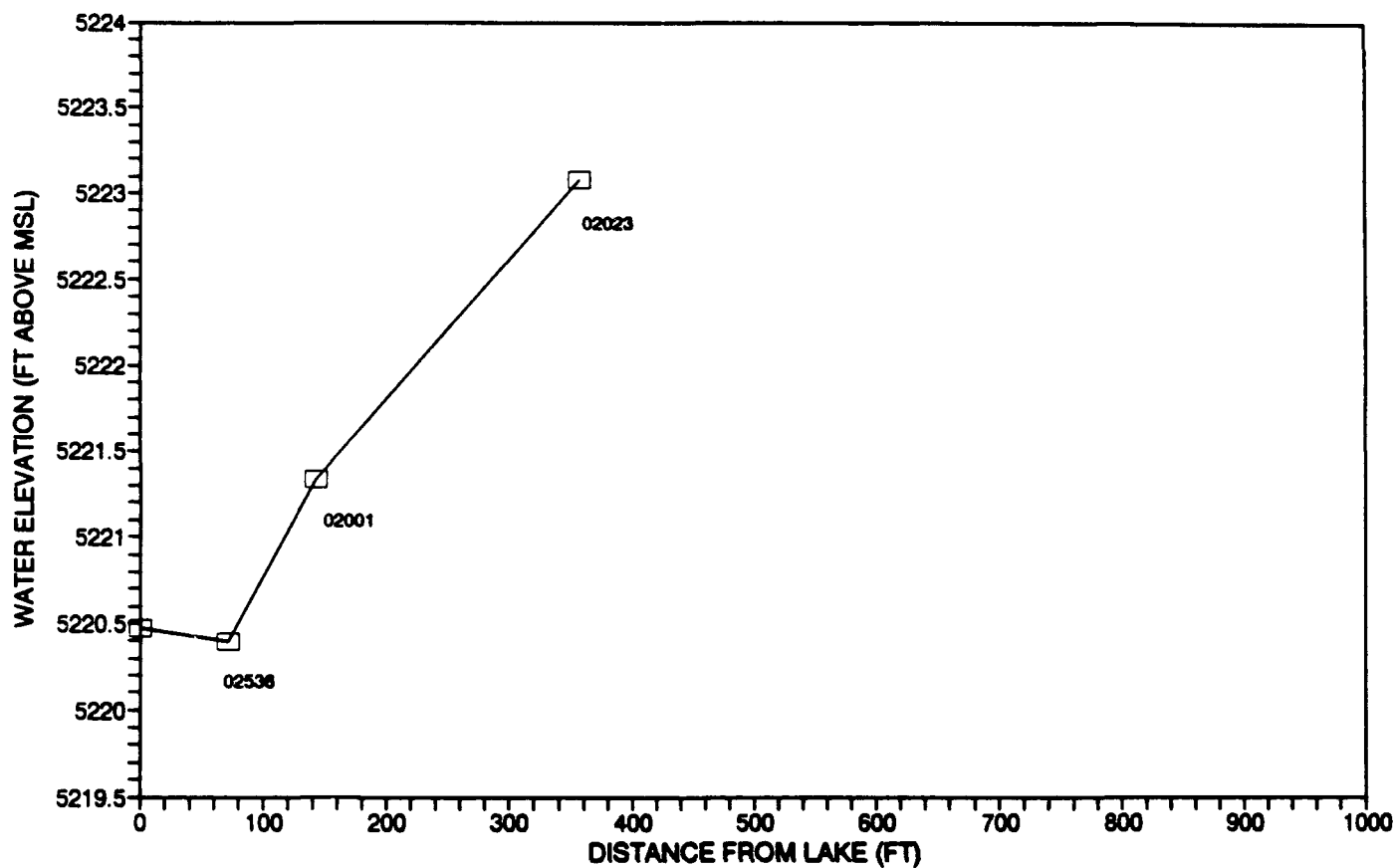


FIGURE 9
WATER LEVELS NEAR LAKE LADORA



—□— 09/13/91

FIGURE 10
WATER LEVELS NEAR LAKE LADORA



—□— 09/13/91

FIGURE 11
LAKE LADORA SURFACE ELEVATIONS

